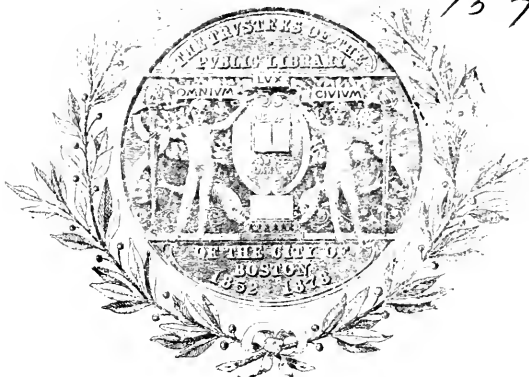


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U. S. DEPARTMENT OF LABOR

JAMES J. DAVIS, Secretary

CHILDREN'S BUREAU

GRACE ABBOTT, Chief

POSTURE CLINICS
ORGANIZATION AND EXERCISES

By

ARMIN KLEIN, M. D.



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LETTER OF TRANSMITTAL

U. S. DEPARTMENT OF LABOR,
CHILDREN'S BUREAU,
Washington, September 21, 1926.

SIR: Transmitted herewith is a report on Posture Clinics; organization and exercises, by Dr. Armin Klein, director of the posture clinic of the Massachusetts General Hospital. The exercises in this report are corrective, designed for children who are suffering from the effects of poor posture, and for use in clinics, just as the exercises in the bulletin entitled "Posture Exercises" are preventive, designed for the normal child and for use in schools.

Acknowledgment is made to Drs. Joel E. Goldthwaite, Robert B. Osgood, and Lloyd T. Brown, and to Dr. Martha M. Eliot, director of the child-hygiene division of the Children's Bureau, for helpful suggestions.

Respectfully submitted.

GRACE ABBOTT, *Chief.*

HON. JAMES J. DAVIS,
Secretary of Labor.

POSTURE CLINICS

IMPORTANCE OF GOOD BODY MECHANICS

After infancy the child learns to stand and walk, and growth is then constituted more on a physiological than on an anatomical basis. Transition from the supine and prone positions to the upright position tends to strain the stabilizing and supporting framework of the body, and the result sooner or later is usually a complete or partial exhaustion of the postural muscles from the pull of gravity. Descent of the ribs and general ptosis follow. By early adult life this becomes more noticeable because of its increase with growth. The posture of the average man, because of the force of gravity and the influences of growth and civilization, becomes drooped or ptotic. With the consequent derangement of the elaborate mechanism maintaining the erect posture of the body comes derangement in position of the viscera, which manifests itself frequently in obscure but distressing ailments of later life.

Bacteria, foods, and poisons are important influences affecting the existence and functions of the human organism that have been receiving due consideration, and the results are strikingly shown in the lengthened expectation of life; but chronic ailments not due to infections, deficiency diseases, or toxins, but to continued habits of wrong living and maladjustments of the individual body to its environment should also be combated. Posture at present is not taught correctly in the family, at school, or by the medical profession as a whole, as is shown by the results of physical examinations at schools and colleges and of the Army examinations during the World War. Poor posture is far more prevalent than good posture. It is present in children of lower school grades and is not outgrown in later life. In fact, defects of posture noted in small children of school age are duplicated in college students and vice versa. To relieve these children suffering from ailments due to their poor posture, posture clinics are definitely necessary, just as necessary as those relieving sufferers from chronic ailments due to other causes.

The program of the future is so to train the individual from early life as to prevent many of the present ailments which are due to poor posture. His interest in his own maximum physical efficiency should be aroused by education. He should realize that the freer and more economical use of the body not only will prevent the chronic ailments that may be due directly to poor posture but by conserving energy will add to the body's power to resist disease and thus prolong still further the period of vigor for man. Thus the teaching of good posture is a phase of preventive medicine which should aid in combating at their outset not only diseases primarily due to poor body mechanics but also those functional conditions for

which poor posture is responsible. Good posture by insuring efficient use of the body may increase the resistance of the body to invasion by outside noxious agents.

Since instruction in the intelligent care, nurture, and training of the body will be most effective if given at an early age and to large groups, such instruction should be given in the schools. When this instruction has a recognized place in the curriculum, education will include in its aim the habitual correct use of the body as well as of the mind.

Even when posture is generally taught in the schools, however, some posture clinics will be necessary to care for children requiring special attention, and until that time the posture clinic with its corrective work fills an especially important rôle. It is the purpose of this pamphlet to discuss the organization of such clinics for the purpose of treating some of the chronic ailments of the individual. From the experience and insight gained from such corrective training of individuals or small groups it has been possible to derive standards for the instruction of large groups so as to prevent incorrect body posture and its sequelæ.¹

POSTURE GRADES AND BODY TYPES

The body is in good mechanical position when the weight of it rests evenly on the heads of the femurs; i. e., the hip joints. In this position the head is balanced above the shoulders, the chest is elevated, and the breastbone is the part of the body farthest forward. The lower abdomen is retracted and flat, and the back curves are within normal limits. In the standing position the hip joints in lateral view are directly in line with the knees and ankle joints. In this ideal standing posture a perpendicular dropped from the ear, or just behind it, would fall through the shoulder, hip, and ankle joints. The anterior groups of muscles, in a state of tonus or of postural or reflex contraction, are balanced² by similar action of the posterior groups of muscles. This static or postural contraction used in sustaining the erect position may be continued indefinitely as it is maintained by the sympathetic nervous system. The normal individual therefore maintains his erect poise with ease, and the skeletal, muscular, and visceral systems are in proper relationship to function efficiently.

In Figure 1 (p. 3) the head is held equipoised above the shoulders so that there is no undue strain on the muscles of the neck and the blood will flow easily and freely to the brain. This makes for mental alertness and vigor.

The chest is held up; "costal" breathing will be unrestricted. The limits of chest expansion will be reached freely and easily, and the lungs therefore will be well aerated. The heart also will not be handicapped in its action. The diaphragm will be elevated and dome shaped, in position for fullest activity and expansion; this will insure fullest aeration of the lungs from the complementary diaphragmatic, or abdominal, breathing.

¹ See *Posture Exercises; a handbook for schools and for teachers of physical education* (U. S. Children's Bureau Publication No. 165, Washington, 1926).

² Sherrington, C. H., M. D.: "Posture." *The West London Medical Journal*, Vol. XXV (1920), pp. 97-106.

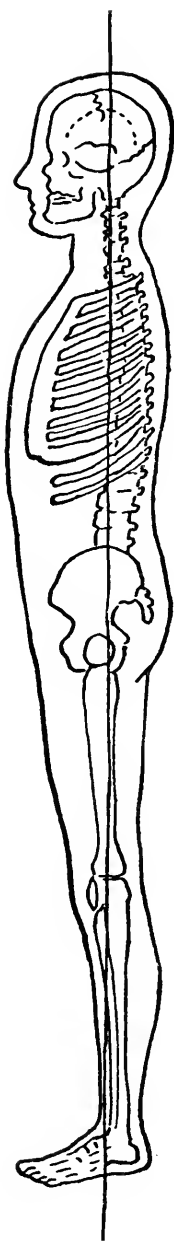


FIG. 1

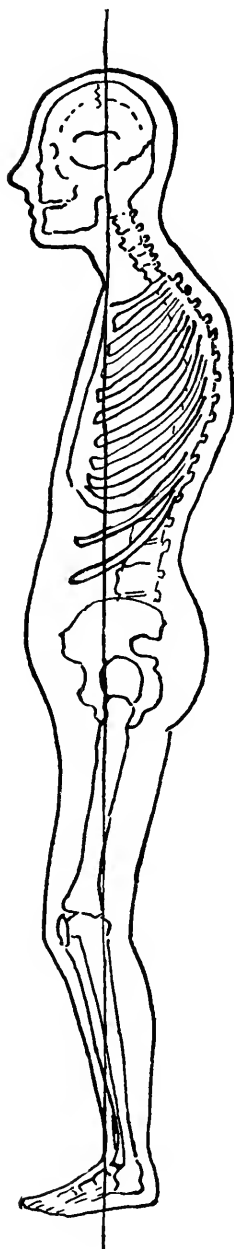


FIG. 2

Skeletal form of a person with good body mechanics (Fig. 1)
and of a person with poor body mechanics (Fig. 2)

The curves of the spine are normal. The segments are balanced on one another, with minimum tension on the muscular and ligamentous stays of the spine. This evenly distributed tension will prevent overstrain on certain parts and the pain that frequently accompanies it.

The lower abdominal muscles are retracted, and the abdominal wall furnishes the necessary support for the abdominal organs in their proper places in the upper abdominal cavity, thus preventing them from sagging. It has been shown that retraction of the lower abdomen is sufficient to raise the stomach and the adjacent organs 1 to 5 inches into the upper abdominal cavity. Food can then pass readily through the stomach and small intestines.

Because the head is held erect, because the chest is up, because the curves of the spines are not exaggerated, and because the lower abdominal muscles are retracted the person whose posture is diagrammatically shown in skeleton form in Figure 1 will function with good balance and form, gracefully, smoothly, efficiently, alertly.

A body with variations from the ideal pictured in Figure 1 (p. 3)—that is, with forward head, drooping chest, hollow back, and protuberant abdomen—has poor posture, the degree depending on the amount of variation.

In Figure 2 (p. 3) the neck muscles from the upper back to the occiput are strained because of the drooped head, and strained, aching, upper-neck muscles are conducive to weakness and listlessness.

The chest has dropped and the antero-posterior diameter is thereby decreased. The ribs so slant from their attachments at the spine that they drop into the chest and so narrow its diameter. This means a definite handicap to the action of the lungs and heart. Because the chest has dropped, the sides of the thorax, originally well rounded (as in fig. 9, p. 13), often become more angular and flattened (as in fig. 10, p. 13). In this flattened chest the diaphragm has not the rounded contour at its origin that is necessary to give it the normal dome shape. It sags relaxed. Its tone decreases. Its excursion becomes shallow.³ Under these conditions the lungs can not be well aerated.

The normal curves of the spine are exaggerated, and the muscular stays of the spine must exert themselves unduly in order to support the body in the erect position. Energy must be expended to balance the slumped body—energy that otherwise might be utilized for ordinary daily needs or stored to increase resistance to disease. If the strain becomes too great, the energy wasted constitutes an absolute deficit, and pain finally appears in the supporting muscles, most commonly in the lower back and the base of the skull. The chest is flattened and dropped and the abdominal muscles become relaxed and lose their tone. Thus the vicious circle is completed, as these muscles "take up slack" and tend to stabilize the parts in their faulty position.

The pelvis is tilted forward, and this faulty position tends still further to relax the abdominal supports and to allow the abdominal organs to drop downward toward or into the pelvis. Constipation,

³ Brown, Lloyd T., M. D.: "Bodily mechanics and medicine." The Boston Medical and Surgical Journal, Vol. CLXXXII (1920), pp. 649-655.

painful menstruation, even the cyclic vomiting of children, it is believed, may be due to these malpositions.

Because the head is dropped downward and forward; because the chest falls down and inward, becoming flat and angular at the sides; because the normal curves of the spine are exaggerated; and because the abdominal muscles are relaxed, the person whose posture is diagrammatically shown in skeleton form in Figure 2 is forced to maintain his equilibrium by overexertion of his spinal muscular supports and by flexed or overextended knees. He is a slouchy, ungraceful, inefficient, uninspiring individual whose functioning is impaired as a result of poor body mechanics.

Posture grades.

Some persons use their bodies like the ideal pictured in Figure 1, the alignment of their body parts being perfect; others do fairly well but not so well as the first group; some stand poorly, and some very poorly. Thus individuals may be classified readily into four grades of body carriage—excellent, good, poor, and bad; or A, B, C, and D (figs. 3, 4, 5, 6, 7, 8, pp. 7-12).

The indexes of excellent posture (A) are, first, head balanced above the shoulders, hips, and ankles; second, chest elevated with the breastbone the part of the body farthest forward; third, abdomen flat and drawn in below but free and mobile above; and, finally, normal unexaggerated back curves.

In good posture (B) the head and chin are inclined slightly forward. As a result the chest drops a little, and the upper part of the back inclines somewhat backward. The abdomen, though perhaps rounded, does not protrude. The lower, or lumbar, spine follows, as it were, the abdomen, and the hollow back shows its first signs of appearance.

In poor posture (C) the head is plainly forward, and the chin protrudes. The curve from the back of the head to the lower end of the shoulder blades is elongated and accentuated. The chest has dropped until it is flat. The relaxed abdomen protrudes, and the lower back is hollow.

In bad posture (D) the head is allowed to drop forward. The chin is dropped. The chest is sunken. The upper trunk has swayed backward. To maintain equilibrium the forward inclination of the lower spine is markedly increased. The back curves are therefore extremely exaggerated. With the sinking of the chest the abdomen drops, relaxed and protuberant. The knees are sometimes bent forward, sometimes sprung backward. The relaxation is complete.

With classification according to grade of body carriage comes an appreciation of the severity of body defects that the subject must overcome to improve his posture. Obviously a child with a D rating has farther to go than the C child, who in turn has farther to go than the B child before they all acquire A posture. The examiner therefore can prognosticate which groups of children, other things being equal, will take longer to learn to maintain a correct attitude. His findings can be passed on to the instructors to enable them to train their patients in body mechanics more sympathetically and intelligently. The patients themselves are stimulated to correct their poor posture. Since the characteristics of the posture grades are defined, the child when graded knows exactly what he must correct. If he

has ordinary ambition he will be stimulated to correct his body defects in order to advance his rating.

Classification according to body type.

It becomes apparent that gradations in body carriage vary with individuals. Generally speaking, the indexes of bad posture are the same in two given persons, although they may appear to differ greatly. Basic differences in body structure determine the specific appearance of individuals classified in the various posture grades.

Stocky individuals, as they assume the relaxed attitude, lean backward from the middle of the back, the dorsolumbar junction (figs. 3, 4). Thin individuals with poor use of their bodies sway backward from the lowest part of the spine (figs. 5, 6). The pelvis at the same time is tipped forward. Individuals of the intermediate type, as they deviate from good poise, bend backward not at the middle of the back as do the broad, stocky persons, nor at the lowest part of the spine as do the thin persons, but midway in the lower back or lumbar spine (figs. 7, 8). These three types of anatomical structure—broad, intermediate, and thin—are easily recognized if seen "pure."

The thin type has a torso long and slender or delicate and narrow and a long, thin neck. The length in the lumbar region is striking. Frequently there may even be six lumbar vertebræ instead of the usual five. The elongated spine gives more flexibility, and this explains the marked slump, or ptosis, possible in these persons. They sometimes look as if some heavy force were pushing them down from above; so much so that they sway far backward in the upper back and protrude far forward in the lower back, the pelvis tipping forward with the lower spine. The shoulders may become markedly rounded and forward and the shoulder blades scaphoid. The extremities and their muscles are usually long and slender.

The broad type includes the heavy-looking, "broad-backed" persons with large skeletons. The neck is short and "chunky." The torso is broad and relatively short. The lumbar region is short, sometimes because there are only four lumbar vertebræ instead of the usual five and sometimes because the sacrum is set well down between the hip bones. Because of the very construction of the spine the lumbar curve is less marked. Flexibility is lacking in this sturdily built spine. The extremities are large and broad. This is the type that tends to be obese.

In the intermediate type the torso is a compromise in length and breadth between the other two types. The normal rounded curves of the spine, if they become exaggerated, appear mild and gradual. The sharp "corners" of the thin type and the large fatty deposits of the broad type are missing. The neck may be almost as long as that of the thin type; or it may be short, though hardly so thick and "chunky" as in the broad type. The musculature is firm. Flexibility of the spine, though not so marked as in the thin type, is much greater than in the broad type. This intermediate class is heterogeneous; it should include all individuals that do not fall readily into either of the other groups. After study and experience the fundamental characteristics of the thin and stocky types will ordinarily be seen to predominate sufficiently in the individuals examined to warrant classification in one of these types. When, however, characteris-

POSTURE STANDARDS

Stocky-Type Girls

Excellent Good

Poor Bad



A



B



C



D

EXCELLENT POSTURE

1. Head up—chin in (Head balanced above shoulders, hips, and ankles)
2. Chest up (Breast bone the part of body farthest forward)
3. Lower abdomen in, and flat.
4. Back curves within normal limits.

GOOD POSTURE

1. Head slightly forward.
2. Chest slightly lowered.
3. Lower abdomen in (but not flat)
4. Back curves slightly increased.

POOR POSTURE

1. Head forward.
2. Chest flat.
3. Abdomen relaxed (Part of body farthest forward)
4. Back curves exaggerated.

BAD POSTURE

1. Head markedly forward.
2. Chest depressed (Sunken)
3. Abdomen completely relaxed and protuberant.
4. Back curves extremely exaggerated.

Children's Bureau, United States Department of Labor, Washington, D.C., 1926.

FIG. 3

POSTURE STANDARDS

Stocky-Type Boys

Excellent Good

Poor Bad



A



B



C



D

EXCELLENT POSTURE

1. Head up—chin in (Head balanced above shoulders, hips, and ankles)
2. Chest up (Breast bone the part of body farthest forward)
3. Lower abdomen in, and flat.
4. Back curves within normal limits.

GOOD POSTURE

1. Head slightly forward.
2. Chest slightly lowered.
3. Lower abdomen in (but not flat)
4. Back curves slightly increased.

POOR POSTURE

1. Head forward.
2. Chest flat.
3. Abdomen relaxed (Part of body farthest forward)
4. Back curves exaggerated.

BAD POSTURE

1. Head markedly forward.
2. Chest depressed (Sunken)
3. Abdomen completely relaxed and protuberant.
4. Back curves extremely exaggerated.

Children's Bureau, United States Department of Labor, Washington, D.C., 1925.

FIG. 4

POSTURE STANDARDS

Thin-Type Girls

Excellent Good

Poor Bad



A



B



C



D

EXCELLENT POSTURE

1. Head up—chin in (Head balanced above shoulders, hips, and ankles)
2. Chest up (Breast bone the part of body farthest forward)
3. Lower abdomen in, and flat.
4. Back curves within normal limits.

GOOD POSTURE

1. Head slightly forward.
2. Chest slightly lowered.
3. Lower abdomen in (but not flat)
4. Back curves slightly increased.

POOR POSTURE

1. Head forward.
2. Chest flat.
3. Abdomen relaxed (Part of body farthest forward)
4. Back curves exaggerated.

BAD POSTURE

1. Head markedly forward.
2. Chest depressed (Sunken)
3. Abdomen completely relaxed and protuberant.
4. Back curves extremely exaggerated.

Children's Bureau, United States Department of Labor, Washington, D.C., 1926.

FIG. 5

POSTURE STANDARDS

Thin-Type Boys

Excellent

Good

Poor

Bad



A



B



C



D

EXCELLENT POSTURE

1. Head up—chin in (Head balanced above shoulders, hips, and ankles)
2. Chest up (Breast bone the part of body farthest forward)
3. Lower abdomen in, and flat.
4. Back curves within normal limits.

GOOD POSTURE

1. Head slightly forward.
2. Chest slightly lowered.
3. Lower abdomen in (but not flat)
4. Back curves slightly increased.

POOR POSTURE

1. Head forward.
2. Chest flat.
3. Abdomen relaxed (Part of body farthest forward)
4. Back curves exaggerated.

BAD POSTURE

1. Head markedly forward.
2. Chest depressed (Sunken)
3. Abdomen completely relaxed and protruberant.
4. Back curves extremely exaggerated.

Children's Bureau, United States Department of Labor, Washington, D.C., 1926.

FIG. 6

POSTURE STANDARDS

Intermediate-Type Girls

Excellent Good

Poor Bad



A



B



C



D

EXCELLENT POSTURE

1. Head up—chin in (Head balanced above shoulders, hips, and ankles)
2. Chest up (Breast bone the part of body farthest forward)
3. Lower abdomen in, and flat.
4. Back curves within normal limits.

GOOD POSTURE

1. Head slightly forward.
2. Chest slightly lowered
3. Lower abdomen in (but not flat)
4. Back curves slightly increased.

POOR POSTURE

1. Head forward.
2. Chest flat.
3. Abdomen relaxed (Part of body farthest forward)
4. Back curves exaggerated.

BAD POSTURE

1. Head markedly forward.
2. Chest depressed (Sunken)
3. Abdomen completely relaxed and protuberant.
4. Back curves extremely exaggerated.

Children's Bureau, United States Department of Labor, Washington, D.C., 1925.

POSTURE STANDARDS

Intermediate-Type Boys

Excellent Good Poor Bad



A



B



C



D

EXCELLENT POSTURE

1. Head up—chin in.
(Head balanced above shoulders, hips, and ankles)
2. Chest up
(Breast bone the part of body farthest forward)
3. Lower abdomen in, and flat.
4. Back curves within normal limits.

GOOD POSTURE

1. Head slightly forward.
2. Chest slightly lowered
3. Lower abdomen in (but not flat)
4. Back curves slightly increased.

POOR POSTURE

1. Head forward.
2. Chest flat.
3. Abdomen relaxed (Part of body farthest forward)
4. Back curves exaggerated.

BAD POSTURE

1. Head markedly forward.
2. Chest depressed (Sunken)
3. Abdomen completely relaxed and protruberant.
4. Back curves extremely exaggerated.

Children's Bureau, United States Department of Labor, Washington, D.C., 1925.

FIG. 8

tics peculiar to these types do not so stand out, classification in the intermediate type is logical. In this group should fall those who might have a tendency toward thin or broad characteristics but do not actually possess them.

Corrective needs of the different types.

When classification as to body form has been completed it is clear what may be expected of the individuals of different types. The broad type usually are fitted anatomically for slow, heavy, "laborious" work; the thin type for work requiring speed or agility; and the intermediate type for either kind of work according to whether their physical characteristics incline more to one group or the other. If in the industrial world employees were selected according to the anatomical types best fitted for special kinds of work, they would be more efficient individuals, more efficient employees, and more efficient members of society.

It should also be remembered that with classification of body type comes appreciation of the effort necessary for any person to maintain good body carriage. The broad type leaning backward only in the upper spine has to be taught principally to mobilize the chest and to keep it raised in order to straighten the spine. Attention in

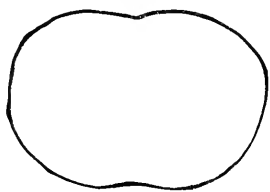


FIG. 9



FIG. 10

Tracing of the contour of the chest (at about the lower level of the shoulder blades) of a person with good posture (Fig. 9) and of a person with poor posture (Fig. 10)

that case should be concentrated on exercise of the upper thorax and head. A slight amount of "pelvic roll" is usually necessary to balance the lower back. Then the body mechanics is corrected.

The problem with the thin type is greater. The long, thin, willowy bodies are easily contorted into almost grotesque shapes. As has been mentioned, some persons of this type appear to be laboring under the effects of a compressing load at the upper end of the spine. First the pelvis must be rolled backward; usually it has tipped so far forward that it is rather difficult to get it back to its ideal inclination. Then the upper chest must be balanced over the pelvis and lower back. This again is often quite difficult. At first in bringing the thorax and head into proper position the patient is likely to lose the correct position he has just learned for the pelvis and lower back. But with patience on the part of the instructor and diligence and assiduity on the part of the patient good body mechanics is finally learned. It is most difficult for the thin type, however, and this should be understood in training them.

The persons of the intermediate type are hardly so limber and willowy as the thin type but are more flexible than the broad type. Some individuals, perhaps, will find it hard to roll their pelvis and lower back into proper position; others will find it more difficult to

balance the chest and head on the fixed lower back and pelvis. Instruction should be directed to the difficulty and concentrated there. The very fact that the patient can not easily correct the maladjustment of posture associated with his anatomical structure is a clear indication that individual instruction is essential.

The examiner classifying individuals according to grades of posture and physique can, from his knowledge of the workings of the different types, direct the attention of the instructor to the part of the body where correction is most needed.

RESULTS OF POOR POSTURE

When the body is not in proper mechanical position it must function with some of its vital parts out of alignment. The human body may then compensate for this strain through its inherent reserve power. Once this ability to compensate is lost, however, symptoms of deranged physiology may appear, and the parts affected will show signs of strain, at first, perhaps, vague but nevertheless severe in their cumulative effect. When slight and merely annoying in character, the signs seem plausibly to indicate deranged physiology due to poor body mechanics. When severe, however, they may seem out of all proportion to the defect in posture that is the apparent cause. Then only a most thorough and searching examination, to rule out other factors as possible causes of the complaints, can determine their origin. If such an examination by an internist or a pediatricist reveals no organic explanation, then and only then should these symptoms be attributed to poor posture.

Backache may be due specifically to poor posture. Strain of the supporting muscles and ligaments of the spine from maintaining the erect attitude in a position of mechanical disadvantage eventually may result in pain. But other affections of the spine—for instance, tuberculosis, the so-called arthritic processes, and other organic lesions, abdominal or pelvic—must first be ruled out as causative factors. Backache in the middorsal region between the shoulder blades or at the “small of the back” in the lumbosacral region, and many “headaches” at the base of the skull may be relieved by balancing the entire spine in its position of normal curvature.

Constipation also may be due specifically to poor posture. With incorrect body mechanics the relaxed protuberant abdominal wall does not support the stomach and intestines adequately. Ptosis and then partial stasis in the gastrointestinal tract may follow. However, obstructions due to some chronic organic lesion, subacute inflammatory processes, atonic and congenital conditions of the intestines, and incorrect dietary and other habits must first be ruled out as causes. Correcting the posture can raise the abdominal viscera from 1 to 5 inches, to the highest position for these organs for the given individual. Abdominal muscle contraction, such as is necessary for good posture, will generally accomplish this most effectively in subjects with lax abdominal walls.

Abdominal pain, chest pain, and pain in the limbs may sometimes be due specifically to poor posture. The attitude with exaggerated spinal curves may produce signs of pressure on the dorsal roots of the spinal nerves with segmental distribution of pain along the route

of the branch nerves.⁴ Here again, however, appendicitis, tabes mesenterica, herpes zoster, pleurisy, bursitis, varicose veins, tabes dorsalis, and many other organic conditions must first be eliminated as etiological factors. Correcting the posture will relieve pressure on the nerve roots as they emerge from the vertebral foramina, and will be followed by a cessation of symptoms if there is no organic difficulty.

In many cases where no active disease is present dysmenorrhea may be attributed directly to poor body mechanics with its associated ptosis and displacement of viscera. The uterus is crowded out of position, and the free circulation of blood through it is interfered with. The supporting ligaments become lax. General body fatigue is present. The result may very well be a discomfort intensified at the period of menstruation. If by means of posture training the lower abdominal wall is retracted the abdominal viscera may be elevated, and the uterus and its adnexa, relieved of pressure from superincumbent abdominal organs, may function normally.

Insomnia, poor or capricious appetite, and "general disability" or neurasthenia may be due indirectly to poor posture with its waste of the available energy of the individual and the consequent bodily fatigue. On extreme physical fatigue nervous or mental irritability may supervene and manifest itself in insomnia, poor appetite, or neurasthenia. But these symptoms also may be due to organic causes which should be eliminated as etiological possibilities before hope is extended to the sufferers from these complaints that they will be relieved by improving their body carriage.

Malnutrition, the petit-mal form of epilepsy, and cyclic vomiting are conditions often improved by correcting body posture. Here again posture training is the method of relief only after all other factors have been eliminated or in connection with treatment for other causes. When the patient has learned to use his body economically he will suffer less from gastrointestinal stasis and fatigue, which are possible causes of these complaints.

In the physical conditions just discussed correction of the body mechanics will afford relief so far as the symptoms may be directly or indirectly referable to disturbed physiology. It must be emphasized that good posture is not a panacea. Thus, it would be absurd for a patient vomiting periodically because of a stomach lesion to hope for relief with postural training; just so with neurasthenia from goiter, constipation from megalocolon, or bachache from early Pott's disease. Only when no organic cause can be found to explain the symptoms should poor posture be considered as the important etiological factor. Sometimes, however, even when other factors are known to be present, if poor posture is associated with them the general condition of the patient may be improved by improving the posture and so increasing the reserve energy with which to combat the other factors.

PURPOSE AND SCOPE OF A POSTURE CLINIC

Persons with complaints referable to disturbed physiology due to poor body mechanics may be relieved of their complaints by the

⁴ Danforth, Murray S., M. D., and Philip D. Wilson, M. D.: "The anatomy of the lumbo-sacral region, in relation to sciatica pain." *The Journal of Bone and Joint Surgery* [Boston], Vol. V, No. 1 (January, 1925), pp. 109-160.

habitual assumption of a good body carriage. For the purposes of this report discussion of methods of treatment will be limited to treatment for children 5 to 15 years of age, though older persons may profit by a similar routine.

The logical site for a posture clinic is the out-patient department or dispensary of a general hospital. Here patients with physical complaints naturally come for treatment. Since posture training should not be given in the hope of relieving symptoms until all etiological factors other than poor body mechanics have been eliminated, it is advantageous to have easily available the adequate hospital facilities for general physical examination and special study to eliminate such other factors.

Patients should be accepted in the posture clinic only when referred to it from other departments of the dispensary. As a routine procedure consultations should be had with all other departments treating given symptoms. When these departments have ruled out the possibility of organic cause for the trouble and are satisfied that disturbed function of body parts is due to the poor position of those parts, the patient should be enrolled in the posture clinic. This clinic will function as a correlating agency. Thus, if a child is sent to the posture clinic from the orthopedic clinic because of "round shoulders and a forward head" a consultation will first be held with the pediatricist, who will make a complete physical examination and advise with regard to further consultation as, for instance, with the ophthalmologist to eliminate eye trouble as a cause for the forward head.

Where a hospital location is not available a clinic will function well if established by a visiting-nurse association in conjunction with child-health centers. Patients will be referred from the neighboring schools by the school nurses and from the district by local physicians. Many cases will be referred from the conferences of the visiting nurse association personnel. Many cases will come directly from the home as a result of cures reported from parent to parent. But here again the child must first be examined by a pediatrician and an orthopedist. Before corrective posture training is begun the etiology of the trouble must be diagnosed as poor body mechanics. To this end consultations should be held with medical men on the staff of the nursing association or of some near-by hospital.

When the child is accepted for training the regular organization of the visiting-nurse association can be used very effectively. The nurses make admirable teachers of good posture in the clinic. They also have the knowledge of medical matters that is essential for productive home visiting in cases of the type treated in the clinic.

Once the child is enrolled in the posture clinic and is started on its routine procedure he is best cared for if an orthopedist and a pediatricist assume joint responsibility for his medical care.

The following are among the kinds of cases referred to the posture clinic of the Massachusetts General Hospital from various departments of the institution: Cases of malnutrition, cyclic vomiting, petit-mal epilepsy, enuresis, constipation, poor appetite, and orthostatic albuminuria from the children's clinic; cases of backache and postural curvatures of the spine from the orthopedic department;

and cases of dysmenorrhea from the genitourinary department, of abdominal and chest pain from the medical and surgical departments, and of general debility and neurasthenia from the medical and neurological departments.

ORGANIZATION OF A POSTURE CLINIC

Location.

The posture clinic, as has been stated, is logically situated in an out-patient or dispensary section of a hospital, or at a child-health center, because it is then located at the source of its greatest supply of patients. The hospital clinic affords opportunity for treatment of those with symptoms of illness due to poor body mechanics. The health-unit clinic, on the other hand, furnishes its quota of those who are usually not ill enough to go to a hospital for treatment. These patients may have in milder form the very same type of symptoms as the patients who go to the hospital clinics for relief.

The clinic should be on an upper floor if possible. Since much of the work is done with the children lying on the floor, it is advisable to move the clinic as far as possible away from drafts, especially of cold air. Moreover, it is easier to keep the child quiet and restful when he is at a distance from the rest of the busy hospital or health-unit activities. The clinic workers can then read to the children or entertain them otherwise while they are resting undisturbed. The maximum amounts of sunlight and ventilation in the clinic room are of course essential.

Equipment.

The equipment needed for the clinic should include a pad for each child to rest on. This should be a cylinder about 18 inches long and about 12 inches in circumference. It can be made of rolls of newspaper, excelsior, or some such material covered with cloth to make a little bolster.

A camera or schematograph with which to make photographs or tracings of the body form is also essential. Cameras taking profile pictures directly on bromide paper are for sale. If such a camera is not available a profile tracing can be made with a schematograph like the one sold by the American Posture League. The writer has used a schematograph made by salvaging an old square-cased camera, which cost about \$6 and some spare moments. The lens was left as found. Directly back of it, however, in the film chamber was put an ordinary mirror facing the aperture back of the lens and fixed at an angle of 45° to the bottom of the case. The top of the film chamber was removed and replaced by a piece of glass. When an undressed patient was placed in front of the camera, with the side of his body toward the lens and with lights shining in back and in front of him a piece of tissue paper placed on the new glass top of the camera would show the image of the patient as reflected by the mirror below. The contour of the image when traced on the paper would give a graphic record of the body contour of the individual before the camera. A tracing of this record as a pattern on black paper and then cut from the black paper on the outline would give as a final result a black silhouette.

An ordinary balance scale of the type usually found in hospitals is adequate for weighing the children. For measuring their height

a wooden measuring rod attached securely and accurately to the wall should be used. When the child stands against it the base of a "right-angle" bracket on the top of the head and against the measuring rod will indicate the child's height.

If the body measurements are to be kept the only equipment necessary is an ordinary pelvimeter or calipers of the type used by obstetricians, a tape measure preferably of steel, and a device for measuring the angle formed by the lower ribs at their junction with the xyphoid cartilage. For this last instrument the writer used two pieces of steel united at one end by a hinge joint and opening sidewise on a protractor. The protractor allows for a reading, in degrees, of the size of the angle formed by the sidewise opening of the two steel arms of the instrument, and since these arms are placed against the angle formed by the lower rib borders the reading on the protractor is the angle of the ribs—the intercostal angle.

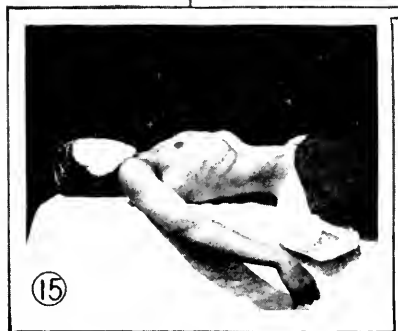
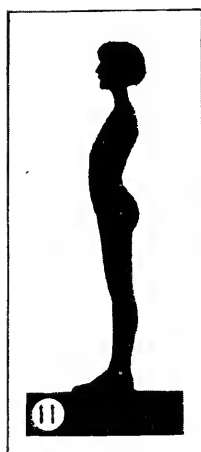
A mirror large enough to show the whole body of the child is a great help in teaching the child correct posture. As is shown in the description of exercises (see p. 28) posture is taught with the child standing up, first against a wall and later away from the wall. Then if the child stands with the side of his body toward the mirror he can see the defects in his body posture and can correct them more readily.

Personnel.

The personnel of the clinic should include an orthopedic surgeon in nominal charge, the examiner and consultant in all problems; one worker in actual charge of the clinic; other workers to teach good posture (at least 1 worker for every 10 patients); and if possible a volunteer secretary. If it is impossible to get secretarial service gratis, the work could be divided among the other members of the staff. The best clinic workers are nurses with a background knowledge of orthopedic nursing and special training in posture work. Of course temperament and personality fitted for work with children are a fundamental requirement. Nurses seem to fit better into clinics than do graduate physical educators because of their knowledge of medical problems and procedure.

Time spent by children in the clinic.

The clinics should be held not less than twice a week and preferably three times. Each session should last generally from one to one and one-half hours. Each child after resting for 20 to 30 minutes should receive 10 to 15 minutes of intensive instruction. While the child is resting a volunteer or one of the staff may read to him or tell him a story. The child will then relax more completely. At the end of his rest period he should receive at first about 5 minutes of individual instruction. Then, with a knowledge of how to do the fundamentals of postural training, he may be grouped with a few others for more or less advanced instruction, requiring about 10 minutes more. Thus, a child will spend only about 35 minutes twice or three times a week in the clinic in learning good body mechanics. He will therefore have to practice at home and repeat at least three times a day all that he has done in the clinic.



FIGS. 11 AND 12.—PROFILE SILHOUETTES OF THE BODY FORM AT THE BEGINNING OF A SCHOOL YEAR AND AT THE END OF A SCHOOL YEAR WITH POSTURE TRAINING

FIG. 13.—PASSIVE PECTORAL STRETCHING EXERCISE

FIG. 14.—CHILD IN RESTING POSITION

FIG. 15.—CHEST EXPANSION WITH DEEP INSPIRATION

FIG. 16.—MANUAL "COACHING" TO INCREASE CHEST EXPANSION

Children who will receive greatest benefit.

Posture instruction in clinics may be expected to benefit most strikingly children, especially girls, between the ages of 7 and 10. The child is then in his most receptive and pliable stage. He has what is very important in posture work—power to coordinate mind and body. His ability to coordinate, and a serious willingness to learn and to cooperate at an age when body defects have not yet become fixed are the characteristics that warrant speedy benefits from postural training for children of 7 to 10. They will be relieved most readily from complaints due directly to poor body mechanics, especially backache and constipation. Of course, all children of ages that can be taught good posture will be expected to derive some benefit from the training in the correct use of the body, and this benefit will be in direct proportion to the children's power to coordinate and willingness to cooperate.

Attendance of mothers at clinic.

Since most of the time spent in learning to use the body well will have to be time out of the clinic and under the parents' supervision, the more the parents know about the subject the more they will stimulate the children to acquire and maintain good posture. Mothers should be urged to attend the clinic with the children once a month. When at the clinic the mothers should be close to the children to see just what they will have to repeat at home, and to receive explanations. At the same time instruction and advice can be given them as to diet and other contributing causes of their children's complaints.

Home visits.

To make sure that the child does repeat at home what he has been taught, follow-up visits should be made to his home. A nurse trained in family-welfare work is ideal, and social-service workers are, of course, also good for this kind of work. During the home visits instructions can be repeated, difficulties that may have cropped out can be eliminated or minimized, and those who are concerned for the well-being of the child can be kept interested in his work. The effect of these visits will invariably be to increase cooperation and thus shorten the time necessary for correcting the child's posture and forming the habit of good body mechanics.

The workers at the clinic and the home visitors should be able to impress on the children and their parents what benefits may be expected if the children use their bodies correctly and what penalties they may be called upon to pay if they do not. Workers should be familiar with the exercises, the manner of doing them, and the reasons for doing them. The fundamentals especially should be clearly understood. In fact, only after much thought on the subject of body mechanics will the workers' ideas become crystallized, but they must be crystallized and ready for logical and quick presentation to the children and their parents.

The worker will create an unconscious feeling of sympathy, the *sine qua non* in this sort of work, if she will put herself in place of the mother she is visiting. Before she makes her visits she should acquaint herself with the history of the family and decide

what motive to concentrate on for appeal. Thus if the children are undernourished or pretubercular an appeal for regular attendance or home cooperation should be based on the children's needs in relation to these physical conditions. The parent may say that the poor child has too little time outside school, elocution, music, and other lessons to devote time to posture training. The worker should then show why the clinic is important for the child, finally stressing the reason that seems to arouse the greatest interest. The gains of some child in the neighborhood who attends the posture clinic and who is conscientious and cooperating may be described. Perhaps it is pride in the appearance of the child that appeals to the mother. If so, she may be shown a picture of Queen Louise, in which the points of good body mechanics can easily be demonstrated. The fact that Queen Louise could not be beautiful if she stood poorly should be stressed. Perhaps the child is undernourished, and the visitor may appeal to the mother's affection by expressing her own interest in improving the child's condition and perhaps showing the mother some weight curves indicating the weight gained by children with malnutrition who have been taught body mechanics. Attention can be centered on changes in posture in children instructed for one season. The improvements can be noted and the values stressed on a physiological and health basis. This visual appeal by graphic curves and figures is usually most effective in transforming the interest of the parents into a desire to see that their children avail themselves of the privilege of learning how the body should be used.

If the child is interested in athletics he may be shown the picture of an athlete finishing a race. The child should be reminded that this posture was taken because the athlete had learned that if his body is thus used his speed and endurance are increased. Workers should show pictures of Washington, Lincoln, and other men of achievement with strikingly good body mechanics. Posture, good or bad, seems to have a mental effect upon the individual which affects, favorably or unfavorably, his capacity to achieve.

Of course, some children will have to be almost dragged to the clinic for instruction in posture. But if the workers are persistent in visiting the home and tactful in stressing the motives that make the strongest appeal to both parents and children they will influence the family toward complete cooperation. The necessity for regular attendance at classes and continuous cooperation in the intervals between classes should be emphasized.

Workers, however, will foster the desire for the acquisition of good body carriage only if they themselves believe in its importance. If they are not interested they should not undertake family visits. They can not imbue others with a spirit that is lacking in themselves. Theirs is missionary work in preventive medicine, for correcting body mechanics is one important way to increase the body's resistance to disease. If they are interested they will learn the subject matter of body mechanics. Then, with thorough confidence in the value of the subject, they will spread the gospel of health and grace from better mechanical use of the body. Above all they must attain correct posture themselves. Their own example will gain as many converts as their words.

RECORD TAKING AND PHYSICAL EXAMINATION

All children enrolled in posture clinics should first be questioned thoroughly by the nurse in charge as to their habit histories. The amount of sleep, the time spent outdoors, dietary and other health habits (see the form at end of report) should be investigated. It is the purpose of the clinic to teach the child one of the habits most effective for health—that of good body carriage. It should also see that the child's other habits upon which proper physiology greatly depends, are also good—fit company for good body mechanics. Af-

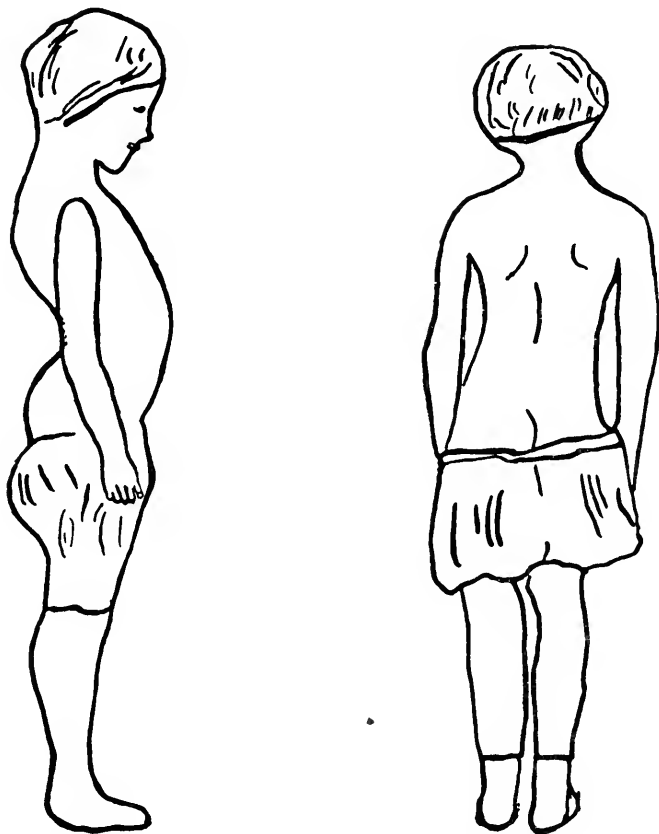


FIG. 17.—Tracing of the body form by means of the schematograph

ter study has been made of the child's likes and dislikes for different foods and of his habits as to times for eating, regularity of meals is urged. A list of proper foods is furnished from which his mother may choose sensible meals. Emphasis is placed on the child's having the amount of sleep deemed sufficient for his age by most authorities. Above all he is instructed—and this point is stressed—to take rest periods after each meal flat on his back on the floor with a pad under his shoulder blades. At no time should he use pillows under his head. The effort is to straighten his spine; pillows would only serve to exaggerate the normal curves at one end.

A history of the child's illnesses previous to entrance into the posture class, on comparison with a similar later history, will indicate the effect of posture on his resistance to infectious diseases. It is assumed that the child has no infectious disease nor organic cause for his trouble when admitted to the posture clinic. This will have been ascertained before his admittance by a routine pediatric examination by the pediatrician in attendance at the posture clinic or the consulting pediatrician in the children's clinic.

Once the child is enrolled, his standing and sitting height in his "stocking feet" are taken. Then his weight while wearing ordinary indoor clothing is recorded. These data furnish the clinic worker, with the help of Wood's table of average weights for children of given sexes, heights, and ages, with an idea of the average weight for a child comparable with the patient. The weights are recorded weekly on plotting paper, and the points are joined to form a weight curve. These curves are always conspicuously displayed on the walls in the clinic. The children naturally vie with one another in following directions, hoping to increase their weight. The value of stimulating such ambition, especially in undernourished children, need hardly be stressed when the importance of good body nutrition is so generally recognized.

A profile silhouette (figs. 11 and 12, facing p. 18) of the body form may be made with a camera directly on bromide paper. If such a camera⁵ is not available a profile tracing (fig. 17) is taken with a schematograph (see p. 21). These silhouettes are posted on a card hung on the wall, so that the children may note their own progress and thereby be stimulated to more energetic work.

After this preliminary work the child should be examined by the orthopedist in attendance at the clinic. First he is classified with reference to his body form as thin, broad, or intermediate, and then he is graded A, B, C, or D on his posture, according to the standards of classification and grading given on pages 5-13. Deformities of the chest or spine and static deformities of the lower limb are then recorded. The part of the trunk where the movements of respiration are featured is recorded; attention is drawn either to the abdomen where the excursion of the diaphragm is the chief feature of respiration or to the ribs when elevated in the costal type of respiration. Finally, with anthropometric measurements such as the girth of the abdomen and chest at different levels and the angle formed by the lower borders of the ribs with the lower end of the sternum the examination of the child is completed.

METHOD OF TEACHING POSTURE TO CHILDREN

First the child lies supine on the floor, over a pad laid crosswise under the back, at the level of the lower angle of the shoulder blades (fig. 14, facing p. 18). He should draw his chin in as if to "make a double chin." The arms should be extended above the head to open up the spaces between the ribs. This position is assumed be-

⁵ Fradd, N. W.: "A new method of recording posture." *The Journal of Bone and Joint Surgery*, Vol. V, No. 4 (October, 1923), pp. 757-758.

cause it relaxes the muscles and ligaments usually contracted in maintaining the body in incorrect posture. The pad under the shoulder blades elevates the chest and tends to straighten the spine, forcing the trunk to the A position. Thus the child rests with his body in its best position. Twenty to thirty minutes is usually necessary to get complete relaxation before any attempt is made at correction of the poor posture. Without this relaxation over a pad correction is much more difficult. The best time for the rest period is after each meal. Then the child benefits not only from getting the relaxation needed for the corrective exercises but also from getting rest during the period of digestion.

After the rest period the pad is removed, and exercises are given to the child lying supine on the floor with knees slightly flexed.

Corrective posture exercises.

Exercise I.—Lying on the floor the child flattens the lower back by rolling the pelvis, i. e., contracts the buttock muscles and retracts the abdominal muscles and so rolls the hip about the hip joint as a pivot (fig. 18 A and B). In doing this he may keep one hand

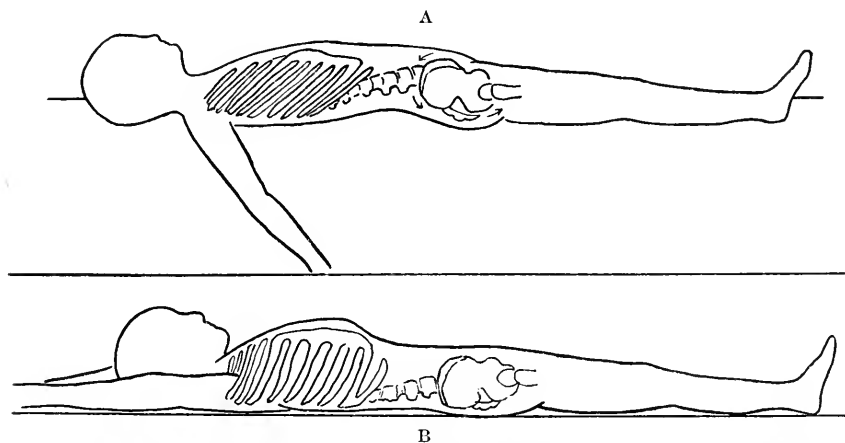


FIG. 18.—Method of correcting poor posture in the supine position by rolling the pelvis as indicated and by drawing in the chin

on the lower abdomen while he uses the other to feel the flattening of the spine against the floor. In this way the child learns to roll the pelvis and to decrease the exaggerated curves of the spine, with the help of gravity.

Exercise II.—Lying with back flattened against floor (as described in Exercise I) the child does deep breathing.

While expanding the ribs in inspiration (fig. 15, facing p. 18) the child may grasp the ribs (fig. 16, facing p. 18) where they form an angle with the lower end of the sternum (breastbone) and may pull on them upward and outward to “coach” the thoracic muscles that cause the outward and upward movement of the ribs in inspiration. Then, since expiration is fundamentally passive, let the child exhale without “coaching” manually. Let him keep on exhaling to the point of complete expiration. This is aided by the contraction of the abdominal muscles.

This exercise increases the girth of the chest, enlarges the lungs through the thoracic movements, and tends to mobilize the dorsal spine and to render it more flexible for flattening.

Exercise III.—Lying with back flattened against the floor (as described in Exercise I) the child alternately raises the arms slowly

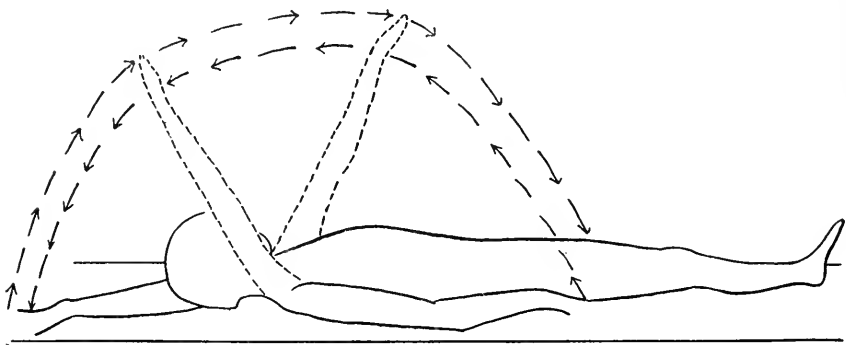


FIG. 19.—Alternate arm raising while good posture is maintained in the supine position

over the head (fig. 19). This accustoms the child to using the arms without changing the position of the back—all with the help of gravity.

Exercise IV.—Lying with back flattened against floor (as described in Exercise I) the child bends knees back over the abdomen. He then grasps one knee with both hands and holds that knee bent

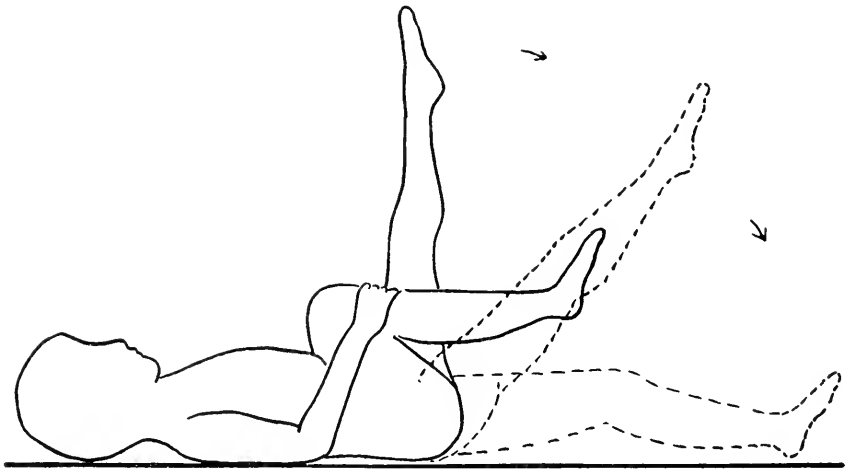


FIG. 20.—Straight leg exercise with one thigh flexed on the abdomen

with the thigh on the abdomen. This keeps the back flat. He extends the other leg straight up from the abdomen and slowly and gradually lowers it to the floor (fig. 20). Then he returns both legs to the starting position and repeats the exercise, alternating the legs.

Through this exercise the child gets the "feel" of keeping the back flat while a leg is being used—and this with the help of gravity and one flexed thigh. The exercise also tends to loosen tightened muscles and ligaments which may prevent full range of motion in the joints—as, for instance, tightened ham strings about the knee.

Exercise V.—Lying with back flattened against the floor (as described in Exercise I) the child raises one leg to an extended position at right angles to the torso and then slowly and gradually lowers it to the floor. Then after returning the legs to starting position he repeats the exercise, alternating them.

This exercise develops the abdominal muscles and the ability to keep the back flattened while using the legs.

Exercise VI.—Lying with back flattened against floor (as described in Exercise I) the child raises both legs to an extended po-

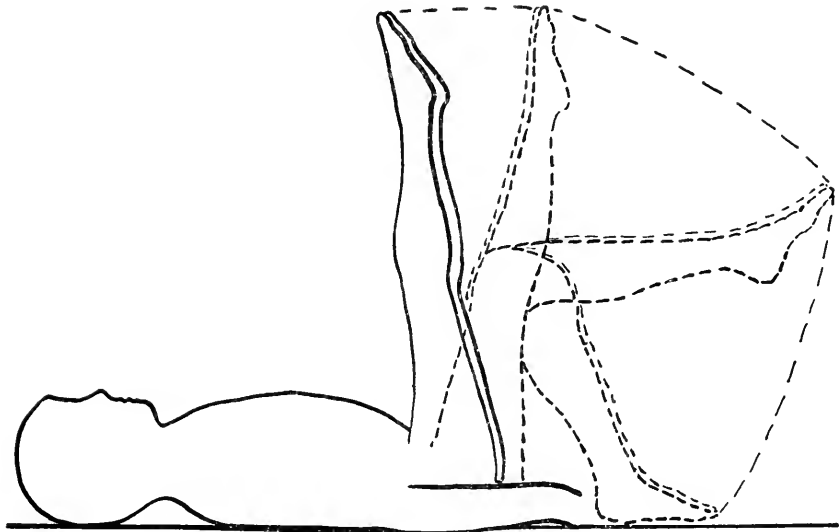


FIG. 21.—Double leg exercise

sition at about right angles to the torso (fig. 21), then slowly and gradually lowers them to an angle of about 45° from the floor. Then since the lower back will begin to arch at about this point he drops the feet to the floor.

This exercise accentuates the development of the abdominal muscles and the ability to keep the back flattened while using the legs.

The foregoing exercises should be continued until the child can flatten his back against the floor fairly well. Then the following group of exercises should be taken in the standing position:

Exercise VII.—Standing with his heels 4 or 5 inches from the wall and with his buttocks, shoulders, and head against the wall the child flattens his back against the wall by contracting the buttock muscles and by pulling in the lower abdominal muscles; i. e., by rolling the hips on the hip joint as a pivot (fig. 22 A and B).

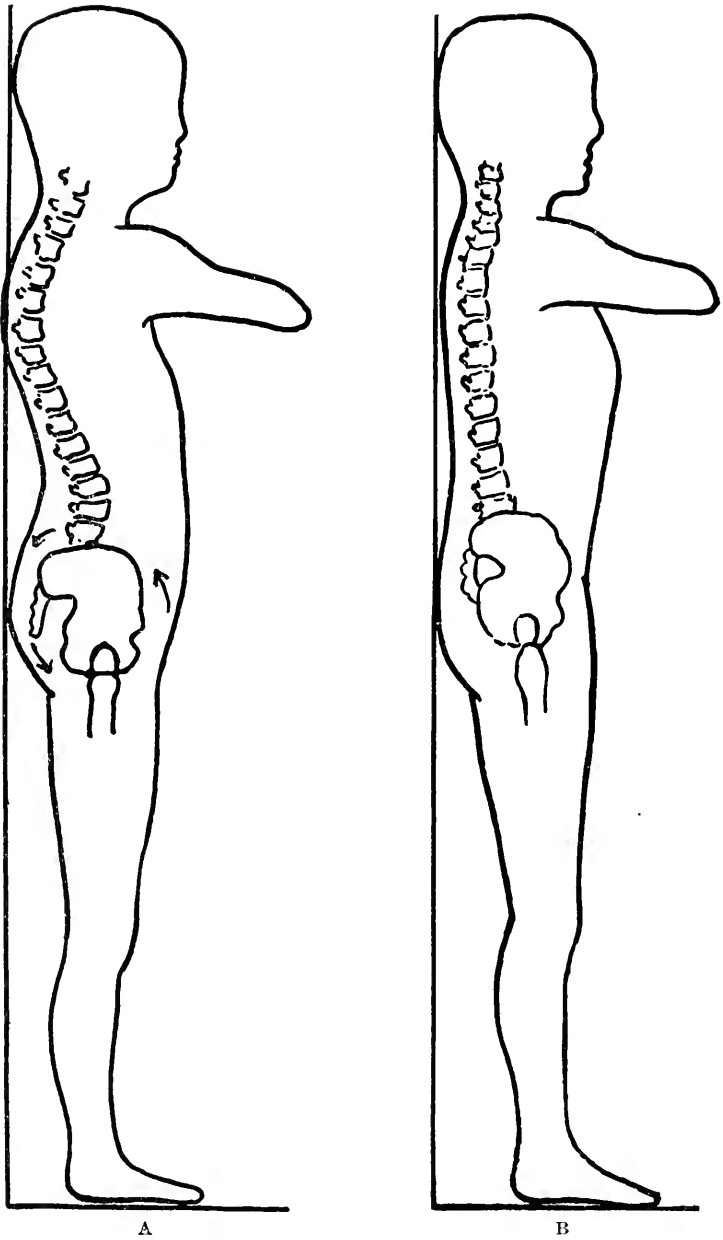


FIG. 22.—Retraction of the abdominal muscles and contraction of the buttock muscles to assume correct posture against the wall

If the child will imagine that he has a tail on the end of the spine and will try to touch the floor with the tail without bending the knees, he will grasp the idea of rolling the pelvis and will get the "feel" of flattening his lower back and of standing erect without the help of gravity. If the child is taught to aim for a flat back he will attain the back desired, one with normal curves. Thus to get the proper position, as shown in Figure 23, A, B, C, the child first

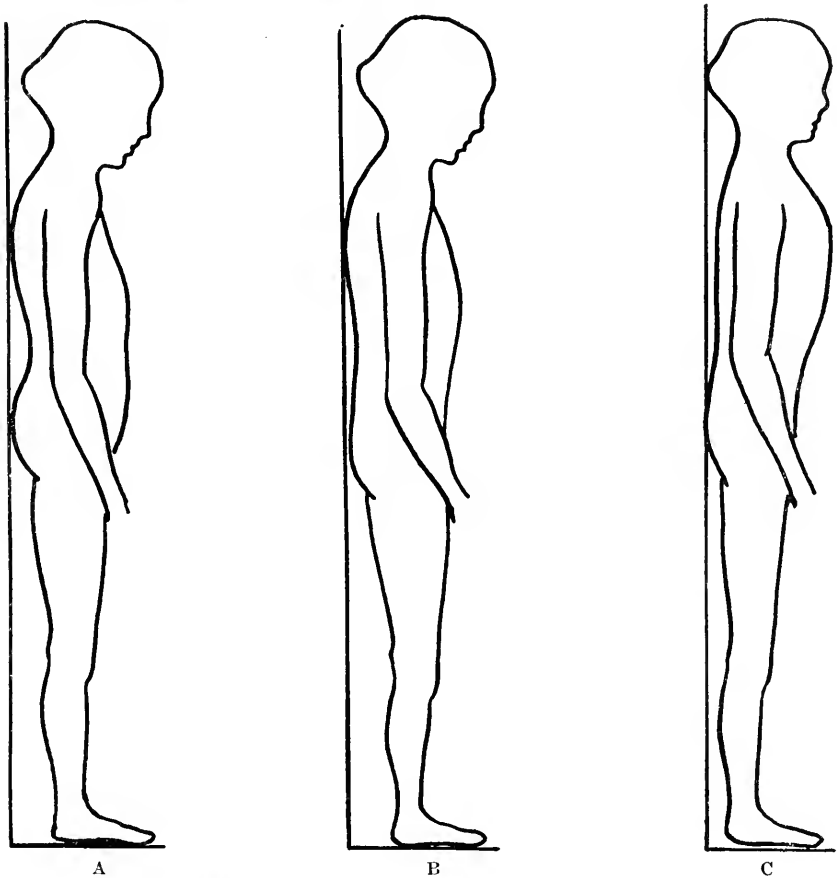


FIG. 23.—Method of correcting poor posture in the erect position

rests the upper back and buttocks against the wall, then flattens the lower back, and finally pulls the head back and the chin in, raising the chest into its proper position.

Exercise VIII.—Standing with back flattened against wall (as in Exercise VII) the child places his hands against wall and with flexion only at the ankle joints comes away from the wall with the body held in the same position as at the start of the exercise. Then while holding this position he should walk forward (fig. 24, A, B, C).

When he can hold position while walking forward let him try to return and still maintain correct body alignment. It is difficult at first to turn around and still keep the correct position. The abdomen, for instance, is held retracted consciously, and when some action like turning around is attempted the conscious control is lost while the mind is busy with the turning.

Exercise IX.—Standing away from the wall with back flattened and chin in, the child bends the trunk forward at the hips (fig. 25 A and B). This exercise may be made more difficult by clasping the hands on the top of the head when starting the exercise. Either

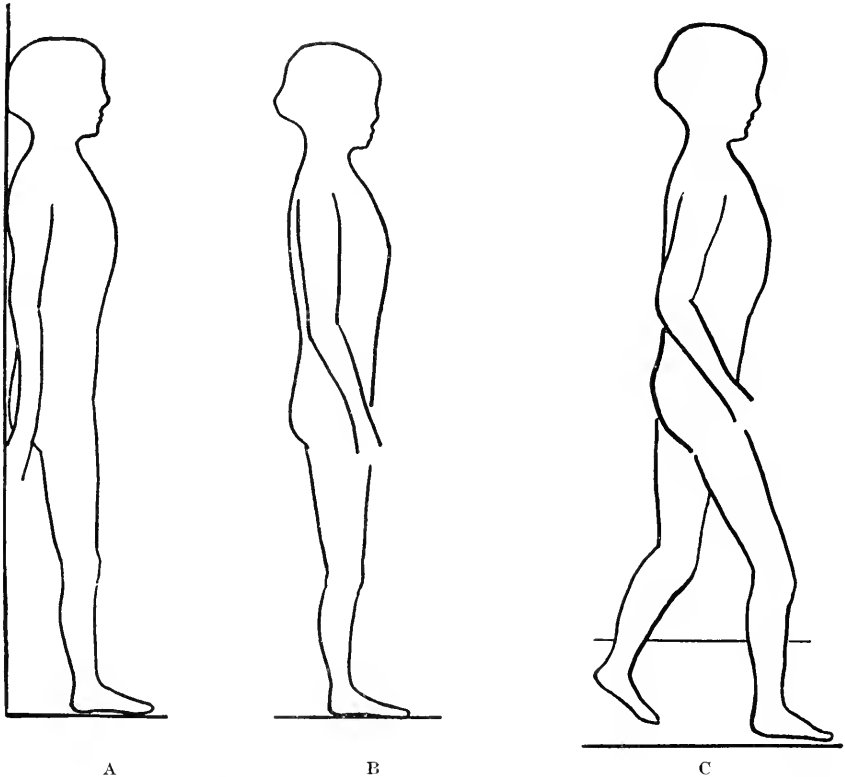


FIG. 24.—Method of walking away from the wall after correct posture has been attained there

way it accustoms the child to maintain a good position and to keep the rib spaces open even while bending forward.

Exercise X.—Standing away from the wall with back flattened and chin in, the child rises on his toes and stretches his arms upward and forward to form an angle of 45° with the axis of his head and neck, and at the same time inhales deeply. Then he lowers his arms and comes down on his heels again while exhaling. This exercise teaches flattening of the spine while the mind is busy with breathing and balancing the body.

Exercise XI.—Standing away from the wall with back flattened and chin held in (the chin must be in so that the ribs will be held

elevated) the child breathes deeply. The hands may be kept clasped on the head or on the lower rib borders to offer resistance there. This resistance facilitates the acquisition of control over the rib muscles.

This exercise tends to strengthen the diaphragm and to teach the child diaphragmatic breathing (fig. 26, A, B, C). Such breathing increases the circumference of the lower thoracic cavity following the descent of the normally dome-shaped diaphragm. The upper abdomen in this exercise is the part of the trunk strikingly mobile with respiration.

Exercise XII.—Standing with as good posture as possible the child faces a corner of the room and places one hand, palm flat and thumbs down, against each wall at shoulder height. With his arms

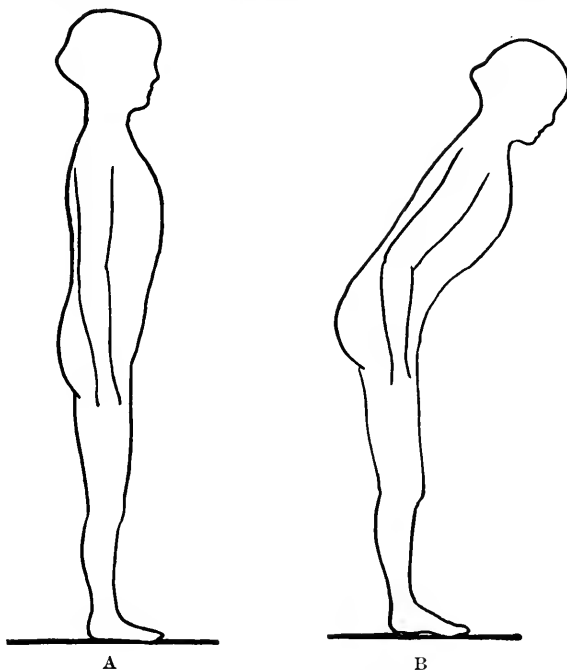


FIG. 25.—Trunk forward bending exercise

held at an angle of about 90° at the elbows and wrists and with upper arms raised to shoulder level he rises on his toes and sways forward with flexion only at the elbows, maintaining at all times the good posture of the start (fig. 27, p. 31). He should not “hollow” the back, drop the head and chin forward, nor drop the abdomen downward. The child returns to starting position and repeats.

A marked strain should be felt on the pectoral group of muscles, the degree depending on the amount of tightening of these muscles. If this exercise does not stretch the tightened pectoral muscles where the shoulders are of the exaggerated forward type (the very round shoulders) the following exercise should be used:

Exercise XIII.—Sitting in good position, the child raises his arms to his shoulders and clasps his hands behind his neck. The assistant

then should put her knee against the child's back at the region of the apex of the dorsal convexity, and when the child has reached deepest inspiration she levers the child's arms back toward herself on her knee as a fulcrum (fig. 13, facing p. 18).

Ways to interest the children.

Through these exercises a child will first learn, with the help of gravity, to attain proper carriage of the body while lying on the floor. Then standing against the wall he can get the feeling of correct posture in the erect position. This is followed, after sufficient practice and exercise, by ability to walk with good body mechanics. All this can be expedited, after a certain amount of preliminary instruction, by having the children put one another through

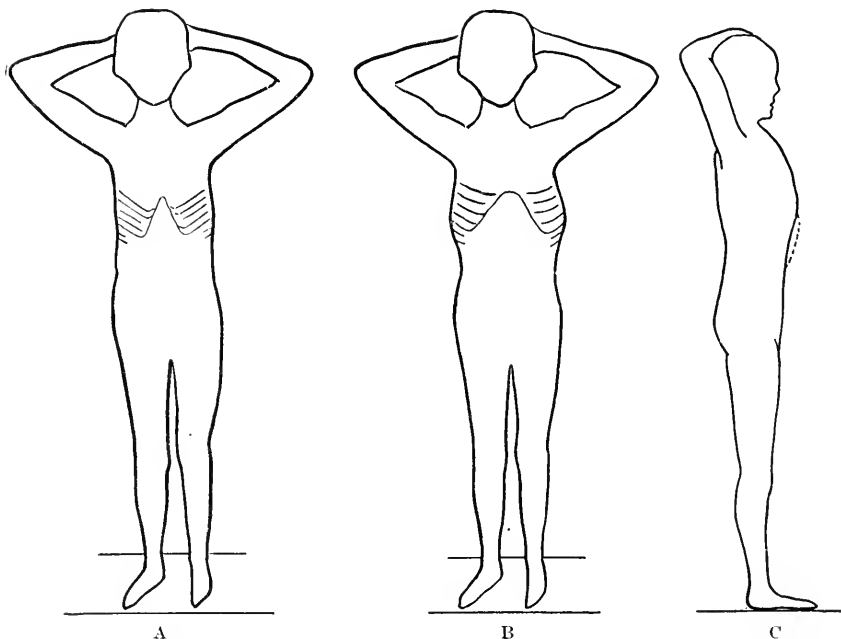


FIG. 26.—Diaphragmatic breathing exercise. A. Starting position. B. Inspiration. (Note how the lower ribs move outward at the sides.) C. Note excursion of the upper abdominal wall with this type of breathing

the exercises. They naturally learn much more quickly while teaching and correcting the faults of others. The interest in and responsibility for a "neighbor's" and also one's own posture under these conditions is remarkable and most encouraging. It is perhaps the pleasantest way of practicing good body posture. Children who have learned the fundamentals may be grouped to do the foregoing exercises or any form of "setting-up drill." They become extremely interested in the work if a different child each day gives the orders while another walks through the group and helps the "instructor" to see that his orders are obeyed accurately. In this way what the children know about posture becomes crystallized in their own minds.

If the children are given as much insight as possible into the fundamentals of good posture they will become more interested

in practicing at home what they learn in the clinic. Skeleton drawings (figs. 1 and 2, p. 3), tracings, photographs, and illustrations of the exercises can be used as aids in teaching body mechanics to the child. He can learn what the indexes of good and bad posture are and analyze his body defects and the needs for correction in his own case and in that of his neighbors in the clinic. Then he will want to correct his own posture and to do so before his neighbor does. This spirit of competition can be stimulated through the use of charts showing the tracings and grades for all the children. The more the child knows of posture the harder he will try to attain good posture.

"Natural" body carriage the result of continuous practice.

At this stage in the acquisition of good body mechanics the posture, though perhaps correct, will usually be stiff and awkward looking. Continuous practice until good body mechanics becomes habitual is the only means of rendering it easy and graceful. Practice in maintaining good form while doing common everyday things, such as sitting, tying shoe strings, picking up objects from the floor, reaching for things, will also hasten the acquisition of natural, graceful, and efficient body mechanics and poise.

Time required to reestablish natural poise.

The time necessary to acquire habitual good body mechanics varies with different individuals. The determining factor is the child's ability to control the muscles of his body and to keep them in balance. With initial conscious effort and with perseverance one can learn to use his body subconsciously with mechanical efficiency, grace, and rhythm and with the least waste of energy, but first must come conscious control of groups of muscles essential to the maintenance of perfect balance. Good habits must replace bad habits until the former become instinctive. The poise which has become essential to the perfect functioning of the complicated machine, the human body, must be reestablished and maintained without effort as it is in the normal young child.

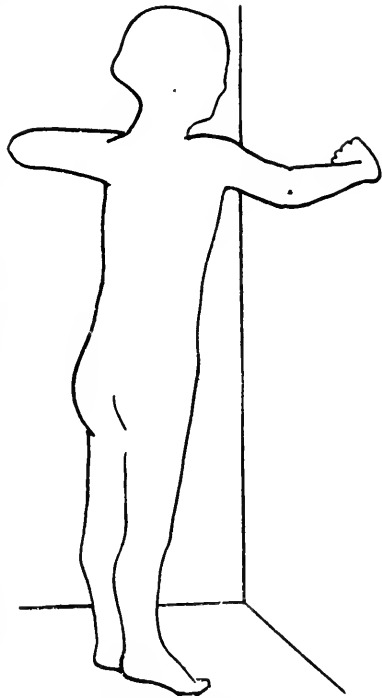


FIG. 27.—Active pectoral stretching exercise

SUMMARY

The average man's posture, because of various influences, has become drooped or ptotic. This is often followed by conditions considered capable of being explained as deranged physiology due to poor body mechanics.

When these manifestations can be interpreted as being due directly or indirectly to such poor posture they can be eliminated by teaching the child how to use his body correctly. In posture clinics children with symptoms apparently without organic cause and referable in some way to poor posture can be relieved by learning the fundamentals of good body mechanics.

The posture clinic is best located in connection with a hospital dispensary, where pediatric and orthopedic clinics may serve as referring agencies; or in conjunction with clinics maintained by visiting-nurse associations or by child-health centers. The posture clinic should cooperate with the various departments of the hospital dispensary and also with health centers, conferences, and schools.

The equipment necessary for the posture clinic is very unpretentious and inexpensive. It consists of a large room, a roll or pad for each child, a camera or schematograph, a weighing scale, an apparatus for measuring height, a pelvimeter, a tape measure, an anglemeter for measuring the angle between the lower rib borders, and a long mirror.

The personnel of the clinic should include an orthopedic surgeon and a pediatricist if no pediatric dispensary is available. There should be an instructor or worker for every 10 patients. The workers may be nurses or physiotherapists. The clinic should also have a worker who can do follow-up work judiciously and sympathetically.

Clinics for instruction should be held at least twice a week. It is supposed that each child will first have had a physical examination by a pediatricist and then by an orthopedist. The latter will classify the child according to physique, grade him according to his posture, and then prescribe the instruction.

First the child must be shown good posture. The indexes of good and poor body mechanics are impressed on his mind. He is instructed in the conscious maintenance of good body carriage with the help of gravity and then without it. Finally, with continuous practice, his carriage should become habitually graceful and easy without conscious effort.

Good posture, however, will come only after continued effort and close cooperation on the part of the child, the parents, and the clinic workers. The clinic staff must strive continuously to effect this cooperation by an attitude of encouragement and approval toward the child and an attitude of interest and understanding toward the parents.



POSTURE STUDY

FIELD No.

OFFICE No.

NAME SEX, M. F. DATE OF BIRTH

RACE, W. B. N. F. O. (SPEC.)

ADDRESS CLINIC

SYM.	HISTORY.	I.	II.	III.	SYM.	HISTORY.	I.	II.	III.
	1. Sleep: (a) Hours night.....	.....(b) Nap, N.....	.....(b) Nap, N.....	.....(b) Nap, N.....		14. Foods liked.....	Bread, N., Cereal, N.....	Bread, N., Cereal, N.....	Bread, N., Cereal, N.....
	2. Hours outdoors.....						Meat, N., Eggs, N., Pot., N.....	Meat, N., Eggs, N., Pot., N.....	Meat, N., Eggs, N., Pot., N.....
	3. Bowel movements.....						Greens, N., oth. veg., N.....	Greens, N., oth. veg., N.....	Greens, N., oth. veg., N.....
	4. Enuresis.....						Milk, N., Butter, N.....	Milk, N., Butter, N.....	Milk, N., Butter, N.....
	5. Other habits (specify).....						Sweets, N., Tea, N.....	Sweets, N., Tea, N.....	Sweets, N., Tea, N.....
	6. Infectious diseases (specify).....	Yes, No.....	Yes, No.....	Yes, No.....			Coffee, N.....	Coffee, N.....	Coffee, N.....
	7. Colds.....	Yes, No.....	Yes, No.....	Yes, No.....		PHYSICAL EXAMINATION.	I.	II.	III.
	8. Sore throats.....	Yes, No.....	Yes, No.....	Yes, No.....		15. Date of exam.....			
	9. Headaches.....	Yes, No.....	Yes, No.....	Yes, No.....		16. Age.....	..... yrs. mos.	..... yrs. mos.	..... yrs. mos.
	10. Other illnesses (specify).....	Yes, No.....	Yes, No.....	Yes, No.....		17. Height.....	..... in.	..... in.	..... in.
	11. Diet preceding day.....	Amt. milk.....	Amt. milk.....	Amt. milk.....		18. Weight.....	..... lbs.	..... lbs.	..... lbs.
	(a) Morn., Hr.....	Food.....				19. Underweight.....	..... lbs. .... %	..... lbs. .... %	..... lbs. %
	(b) Noon, Hr.....	Food.....				Appearance: 20. Grade.....	A B C D.....	A B C D.....	A B C D.....
	(c) Night, Hr.....	Food.....				21. Color skin, memb.....			
	(d) Other, Hr.....	Food.....				22. Eyes, normal (spec.).....	Yes, No.....	Yes, No.....	Yes, No.....
	12. Appetite.....	Good, Poor, Cap.....	Good, Poor, Cap.....	Good, Poor, Cap.....		23. Ears, normal (spec.).....	Yes, No.....	Yes, No.....	Yes, No.....
	13. Digestive upsets.....					Nasopharynx: 24. Adenoids.....	Prob., No, Rem.....	Prob., No, Rem.....	Prob., No, Rem.....
						25. Nasal obstruction.....	Yes, No.....	Yes, No.....	Yes, No.....
						26. Nasal discharge.....	Acute, Chronic, No.....	Acute, Chronic, No.....	Acute, Chronic, No.....
						27. Tonsils.....	Enl., N., Dis., N., Rem. N.....	Enl., N., Dis., N., Rem. N.....	Enl., N., Dis., N., Rem. N.....
						28. Other.....			
						Mouth: 29. Tongue.....	Coated, N.....	Coated, N.....	Coated, N.....
						30. Teeth: (a) No. lost.....			
						(b) No. decayed.....			
						(c) Clean.....	Yes, No.....	Yes, No.....	Yes, No.....
						(d) Enamel deficient.....	Yes, No.....	Yes, No.....	Yes, No.....
						(e) Pyorrhea.....	Yes, No.....	Yes, No.....	Yes, No.....
						(f) Malocclusion.....	Yes, No.....	Yes, No.....	Yes, No.....
						(g) Other.....			

SYM.	PHYSICAL EXAMINATION.	I.			II.			III.			SYM.	PHYSICAL EXAMINATION.	I.			II.			III.		
		Palp.	Enl.	G. Enl.	Palp.	Enl.	G. Enl.	Palp.	Enl.	G. Enl.			Yes, No.	Yes, No.	Yes, No.	Yes, No.	Yes, No.	Yes, No.	Yes, No.	Yes, No.	Yes, No.
	Glands: 31. Oesophageal.....										50. Pronation.....	Yes, No.....		Yes, No.....		Yes, No.....		Yes, No.....		Yes, No.....	
	32. Submaxillary.....										51. Abduction.....										Yes, No.....
	33. Cervical.....										52. Breathing.....	Cos. Up. Abd., Low. Abd.....		Cos. Up. Abd., Low. Abd.....		Cos. Up. Abd., Low. Abd.....		Cos. Up. Abd., Low. Abd.....		Cos. Up. Abd., Low. Abd.....	
	34. Axillary.....										53. Retraction.....	Costal, Abdominal.....		Costal, Abdominal.....		Costal, Abdominal.....		Costal, Abdominal.....		Costal, Abdominal.....	
	35. Epitrochlear.....										<i>Circumference—</i>										
	36. Inguinal.....										54. Abdomen at navel.....		in.....		in.....		in.....		in.....		in.....
	37. Thyroid enlarged.....	Yes, No.....			Yes, No.....			Yes, No.....			55. Axilla: (a) Neutral.....		in.....		in.....		in.....		in.....		in.....
	38. Signs hyperthyroid (specify).....	Yes, No.....			Yes, No.....			Yes, No.....			(b) Inspiration.....		in.....		in.....		in.....		in.....		in.....
											(c) Expiration.....		in.....		in.....		in.....		in.....		in.....
											56. Xyphoid: (a) Neutral.....		in.....		in.....		in.....		in.....		in.....
											(b) Inspiration.....		in.....		in.....		in.....		in.....		in.....
											(c) Expiration.....		in.....		in.....		in.....		in.....		in.....
											<i>Depth—</i>										
	39. Heart (spec. abn.).....	Nor., Abn.....			Nor., Abn.....			Nor., Abn.....			57. Xyphoid: (a) Neutral.....		in.....		in.....		in.....		in.....		in.....
											(b) Inspiration.....		in.....		in.....		in.....		in.....		in.....
	40. Lungs (spec. abn.).....	Nor., Abn.....			Nor., Abn.....			Nor., Abn.....			(c) Expiration.....		in.....		in.....		in.....		in.....		in.....
											58. Abdomen: (a) Normal.....		in.....		in.....		in.....		in.....		in.....
	41. Abdomen (spec. abn.).....	Nor., Abn.....			Nor., Abn.....			Nor., Abn.....			(b) Retracted.....		in.....		in.....		in.....		in.....		in.....
	42. Hernia (specify).....	Yes, No.....			Yes, No.....			Yes, No.....			59. Breadth of chest at xyphoid.....		in.....		in.....		in.....		in.....		in.....
											60. Vital capacity.....	liters		liters		liters		liters		liters	
	43. Reflexes (spec. abn.).....	Nor., Abn.....			Nor., Abn.....			Nor., Abn.....			61. Tracings.....										
											62. Examined by.....										
	44. Type.....	Thin, Nor., Broad.....			Thin, Nor., Broad.....			Thin, Nor., Broad.....			Diagnosis, recommendations:										
	45. Standing position.....	A B C D.....			A B C D.....			A B C D.....													
	General:																				
	46. Shape chest..... (spec. abn.).....	Nor., Abn.....			Nor., Abn.....			Nor., Abn.....													
	47. Scapulae (spec. abn.).....	Nor., Abn.....			Nor., Abn.....			Nor., Abn.....													
	48. Spine (spec. abn.).....	Nor., Abn.....			Nor., Abn.....			Nor., Abn.....													
	49. Other abnormality (specify).....	Yes, No.....			Yes, No.....			Yes, No.....													

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